UNITED STATES DEPARTMENT OF AGRICULTURE
Rural Electrification Administration
Technical Standards Committees
(Electric)

Supplement No. 2, January 1978, to
REA Bulletin 43-5
LIST OF MATERIALS ACCEPTABLE FOR USE ON
SYSTEMS OF REA ELECTRIFICATION BORROWERS

The attached pages for the "List of Materials Acceptable for Use on Systems of REA Electrification Borrowers" are those which have been revised by action of the Technical Standards Committees during the months of October through December 1977. The following changes should be made in order to keep it up to date. Pages with a colon between are on the same sheet, both being changed.

Add New Page	Remove 1977 Page	Add New Page	Remove 1977 Page
a-1	a-1	cg-1:cg-2	cg-1:cg-2
g-1	g-1	cg-3:cg-4	cg-3:cg(1)
g-2	g-2	cg(1)	-
k-1	k-1	cm	cm
k(2)	k(2)	ei:ej	ei:ej
k(3)	k(3)	gx(2)	gx(2)
p-6	p-6	sb-1	sb-1
z-1	z-1	sc-1:sc-2	sc-1:sc-2
af-2	af-2	zz-2:zz-3	zz-2:zz-3
ai-1	ai-1	zz-6	zz-6
ai-2:ai-3	ai-2:ai-3	U an-1.1	U an-1.1
aj	aj	U cg	U cg
an-1.1	an-1.1	U gc	U gc
an-1.3	an-1.3	U gk(1.1)	U gk(1.1)
an-3.1	an-3.1	U hb(2)	U hb(2)
an(1.1)	an(1.1)	U hb(3)	U hb(3)
an(2.1)	an(2.1)	U hq(1)	U hq(1)
an(3.2)	an(3.2)	U hq(3)	U hq(3)
an(5.1)	an(5.1)	U hy(1)	U hy(1)
ap-1:ap-2	ap-1:ap-2	U ja	U ja
bk	bk	U si	U si
bu	bu		

a - Insulator, pin type

Specifications

5 kV - used on 2.4 kV and 2.4/4.16 kV systems

ANSI Class 55-2	Plain	Radio-freed
Flashover, dry	50 kV	45 kV
Flashover, wet	25 kV	25 kV
Leakage distance	5 in.	5 in.
Pinhole diameter	1 in.	1 in.

Chance	C905-1302*
I-T-E (Victor)	8
**McGraw-Edison	NP8D8*
Ohio Brass	12847
Porcelain Products (Knox)	253

7.2/12.5 kV - used on 7.2/12.5 and 7.62/13.2 kV systems

ANSI Class 55-3	Plain	Radio-freed
Flashover, dry	65 kV	55 kV
Flashover, wet	35 kV	30 kV
Leakage distance	7 in.	7 in.
Pinhole diameter	1 in.	1 in.

Chance	C905-1303*
I-T-E (Victor)	5*
Joslyn (Pinco)	L63R*
McGraw-Edison	NP9D8*
Ohio Brass	38148*
Porcelain Products (Knox)	261-S*

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15 kV - used on 7.2/12.5 and 7.62/13.2 kV systems where greater insulation is needed

ANSI Class 55-4	Plain	Radio-freed
Flashover, dry	70 kV	65 kV
Flashover, wet	40 kV	35 kV
Leakage distance	9 in.	9 in.
Pinhole diameter	1 in.	1 in.

Chance	C905-1304*
I-T-E (Victor)	6*
Joslyn (Pinco)	L2064R*
McGraw-Edison	NP21D8*
Ohio Brass	38149*
Porcelain Products (Knox)	366-S*

*Radio freed.

**Available in white as indication of neutral. White insulators are non-radio-freed.

Radio-freed and non-radio-freed insulators made by these manufacturers and in these styles are acceptable.

NOTE: Post insulators (item ea) may be substituted for the crossarm pin (item f) and pin insulator (item a) for both small and large conductor distribution drawings shown in REA Forms 803 and 804 at the option of the owner.

a - Insulator, pin type
(Radio freed)

Specifications

Used on 14.4/24.9 kV
distribution lines.
Radio noise free, metal
thimble

Chance	C906-1301
I-T-E (Victor)	127-R
Joslyn (Pinco)	L1123-R
Ohio Brass	38246-3010
Porcelain Products (Knox)	2027-S

ANSI Class 56-1

Flashover, dry	95 kV
Flashover, wet	60 kV
Leakage distance	13 in.
Pinhole diameter	1-3/8 in.

Used on 33 - 34.5 kV
transmission lines.
Metal thimble

Chance	C906-1303
I-T-E (Victor)	245-R
Joslyn (Pinco)	L75-R
Ohio Brass	38223-3010
Porcelain Products (Knox)	2045-S

ANSI Class 56-3

Flashover, dry	125 kV
Flashover, wet	80 kV
Leakage distance	21 in.
Pinhole diameter	1-3/8 in.

Used on 44 - 46 kV
transmission lines.
Metal thimble

I-T-E (Victor)	255-R
Ohio Brass	38255-3010

ANSI Class 56-4

Flash. dry-wet	140-95 kV
Leakage distance	27 in.
Pinhole diameter	1-3/8 in.

NOTE: Post insulators (item ea) may be substituted for the crossarm pin (item f) and pin insulator (item a) for both small and large conductor distribution drawings shown in REA Forms 803 and 804 at the option of the owner.

f - Pin, crossarm
(With square washer, nut and locknut)

	TRANSMISSION	
Thread (inches diam.)	1-3/8	1-3/8
Length above base (in.)	10	10
Length below base (in.)	7	1-3/4
Shank (inches diam.)	3/4	3/4

	Long Shank	Short Shank
Chance	4332	-
Hubbard	5332	5331
Joslyn	J610*	J633*
Kortick	K7643	K7635
McGraw-Edison	DP7T9*	DP5T24*
Oliver	3420	3470
Utilities Service	3140	3145

* "Static proof" designs available.

g - Crossarms

Applicable Specification: REA Specification DT-5B:PE-16 for Wood Crossarms (Solid and Laminated), Transmission Timbers and Pole Keys

Crossarm Manufacturing and Treating

Firms listed below have acceptable facilities for manufacture and treatment of crossarms or may have their crossarms treated at any one of the plants listed in sections g or zz.

Company	Plant Location
Alabama Wood Treating Corp.	Mobile, Alabama
American Creosote Works	Jackson, Tennessee
American Crossarm & Conduit Co.	Chehalis, Washington (1)
Anthony Forest Products	El Dorado, Arkansas (2) (3)
Brooks Lumber Company	Bellingham, Washington (1)
Conroe Creosoting Co.	Conroe, Texas
Dis-Tran, Inc.	Alexandria, Louisiana
Cascadian Co., Inc.	Eugene, Oregon (3)
Fordyce Wood Preservers, Inc.	Fordyce, Arkansas
Gulfport Creosoting Co.	Gulfport, Mississippi
R. G. Haley International Corp.	Bellingham, Washington
Hatheway-Patterson Corp.	Houston, Texas
Hughes Brothers	Seward, Nebraska (1)
International Paper Co.	De Ridder, Louisiana
Joslyn Mfg. & Supply Co.	Portland, Oregon
Koppers Company	Gainesville, Florida Montgomery, Alabama Morrisville, N. C. (2) (3)
Langdale Company	Valdosta, Georgia
Lockhart Lumber Co.	Lockhart, Alabama
Wm C. Meredith Co.	Atlanta, Georgia
Moss-American, Inc.	Meridian, Mississippi
Neidermeyer-Martin Company (Pacific Wood Treating Corp.)	Ridgefield, Washington
Pennington West Coast Sales Co.	Beardstown, Illinois (3) Eugene, Oregon (3)
Plantation Wood Products, Inc.	Albany, Georgia
Southern Wood Piedmont Co.	East Point, Georgia Spartanburg, South Carolina
Structural Wood Systems	Greenville, Alabama (2) (3)
John C. Taylor Lumber Sales, Inc.	Sheridan, Oregon
Texas Tie & Timber Company (W. J. Smith Wood Preserving Co.)	Denison, Texas
Utility Structures Engineering, Inc.	Fresno, California (2) (3)
Weekly Lumber Company	Rockledge, Florida Tampa, Florida
Wyckoff Company	Seattle, Washington

(1) Laminated & Solid Sawn
(2) Laminated Only
(3) Crossarm Manufacturing Only
No Number Indicates Solid Sawn Only

g - Crossarms

Crossarm Treating Only

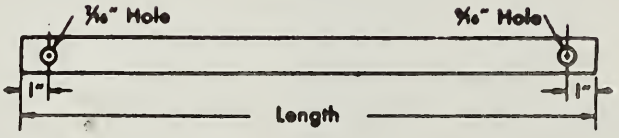
Firms listed below have acceptable crossarm treating facilities, but do not manufacture crossarms or treat poles.

Company	Plant Location
Casswood Treated Products Co.	Beardstown, Illinois

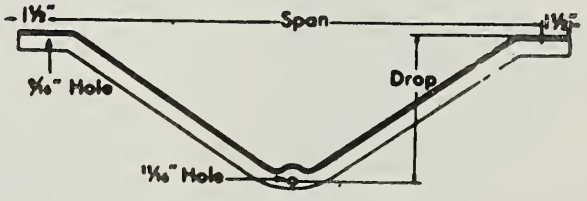
h - Brace, crossarm, steel

Size (inches)	1¼ x ¼	1½ angle x 3/16
Style	Flat	Bow
Centers (inches)	26	60
Length (inches)	28	-
Drop (inches)	-	18

Chance	7128	6942
Dixie	D7128	D6942
Hubbard	8128	7942
Hughes Brothers	2809.5	---
Joslyn	J7128	J1508
Kortick	K1428	K1815
McGraw-Edison	DB2F5	DB1L5
Oliver	5228	5244
Util. Service	5243	5217



Flat Brace



Bow Brace

NOTE: The braces listed on this page may, at the borrower's option, substituted for wood braces, item cu, specified on 7.2/12.5 kV drawings. They may not be used for 14.4/24.9 kV construction.

k - Insulators, suspension

ANSI Class Type	52-9 Clevis	52-1 Clevis	(1) Clevis	(1) Ball & Socket
Disc Diameter	$4\frac{1}{4}$"	6"	9" or $9\frac{1}{2}$"	9" or $9\frac{1}{2}$"
M & E Rating, lbs.	10,000	10,000	15,000	15,000
Leakage, inches	6-3/4	7	$11\frac{1}{2}$	$11\frac{1}{2}$
Flashover; kV: Dry-Wet	60 - 30	60 - 30	80 - 50	80 - 50
NOTES	(3)(4)(6)	(3)(4)	(1)(5)	(1)(2)

Manufacturer	Catalog Number			
Chance	C907-0209	C907-0001 (6)	-	-
I-T-E (Victor)	877	804 (6)	-	-
Joslyn (Pinco)	L1814	L1510	-	-
Lapp	6815-G70	6605	9100	9000
Locke	16044	16583	-	-
Ohio Brass	42399	32433	48019	48008
Porcelain Prod. (Knox)	20034	86012	-	-
Sediver	CT-4R2	-	-	-

Notes:
(1) Not included in the current ANSI Standard.
(2) To be used only on transmission lines.
(3) To be used only on distribution lines.
(4) Use two insulators for 7.2/12.5 kV deadends and three insulators for 14.4/24.9 kV deadends.
(5) Use two insulators for 14.4/24.9 kV deadends.
(6) Either malleable iron, steel or aluminum hardware is acceptable.

k - Insulators, suspension

ANSI Class Type	52-3 Ball & Socket	52-4 Clevis	52-5 Ball & Socket	52-6 Clevis
Disc Diameter	10"	10"	10"	10"
M & E Rating, lbs.	15,000	15,000	25,000	25,000
Leakage, inches	11½	11½	11	11
Flashover; kV: Dry-Wet	80 - 50	80 - 50	80 - 50	80 - 50
NOTES	(2)	(1)	(2)	

Manufacturer	Catalog Number		
I-T-E (Victor)	900	800	924	815
Joslyn (Pinco)	L1060	L1070	L1500	L1570
Lapp	8200	8100	5960G	2300
Locke	20S840	20S580	30S255	30S257
Ohio Brass	32440	32439	47410	47415
Porcelain Prod. (Knox)	81022	81012	-	-

Notes: (1) Use two for 14.4/24.9 kV deadends.
(2) To be used only on transmission lines.

k - Insulators, suspension

Manufacturer	Meeting No. and Date	Conditions (Apply to all)
Joslyn (Pinco)		For the purpose of obtaining operating experience as follows:
9" suspension insulator	801	
Catalog No. L-960 (Ball and Socket)	9/24/64	1. On transmission lines
Catalog No. L-970 (Clevis)	1102 11/18/76	a. Single pole lines 69 kV and below,
Locke		b. Tap lines from existing transmission systems, 69 kV and below, and
9" suspension insulator	799	c. Maximum design loading in tension not to exceed 5000 pounds.
Catalog No. 15S410 (Clevis)	8/6/64	2. On distribution lines
Catalog No. 15S409 (Ball and Socket)		

Conditional List
k(2)
January 1978

k - Insulator, suspension

Manufacturer	Meeting No. and Date	Conditions
Sediver		
10" suspension insulator	997(7/27/72)	To obtain experience.
CT-6R2 (clevis, 15,000 lbs.)	1068(6/26/75)	
N-6R2 (ball & socket, 15,000 lbs.)		
CT-12R (clevis, 25,000 lbs.)	997	
N-12R (ball & socket, 25,000 lbs.)	7/27/72	

k - Insulator, distribution deadend

Manufacturer	Meeting No. and Date	Conditions
Permali		
Distribution deadend	1019	For the purpose of gaining operating experience as follows:
RL-15 (15 kV line-to-line)	6/21/73	1. For distribution lines only.
RL-25 (25 kV line-to-line)	1045 7/11/74	2. To be used only in a horizontal position on deadends. Not to be used as vertical suspension insulators.
		3. Recommended maximum working load is 5,000 lbs.
Chance		
Distribution deadend	965	Same as above.
Catalog No. C654-0000 "Epoxilator II" (15 kV line-to-line)	4/22/71	
Catalog No. C654-2500 "Epoxilator II" (25 kV line-to-line)	1082 1/22/76	Same as above.
Joslyn		
Distribution deadend	1074	For the purpose of gaining operating experience as follows:
UDI 671-3002	9/25/75 1088 4/15/76	1. For distribution lines only, up to 15 kV line-to-line voltage.
Distribution deadend	1074	For the purpose of gaining operating experience as follows:
UDI 671-3010	9/25/75 1088 4/15/76	1. For distribution lines only, up to 25 kV line-to-line voltage.

1 - Clamp, deadend

Copper 2 through 6 CWC 4A through 8A		DISTRIBUTION ACSR 4/0 & 3/0	.2/0	1/0	2 & 4
-	ALCOA	302**	302**	302**	302**
-	Anderson Elec.	PG57N**	PG57**	PG-46N**	PG-46N**
-	Bethea/National	DA-20N**	DA-15-N**	DA-15-N**	DA-15-N**
2111	Joslyn (Brewer-Titchener)	5011 5210**	2116	2116	2107* 2115
-	C & R	CR-20-90**	CR-10-90**	CR-10-90**	CR-10-90**
2111	Knox	5011 5210**	2116	2116	2107* 2115
20300C	Lapp	 52552**	7511B 52550**	7511B 52550**	20300C 52550**
80500	Ohio Brass	80442 89237**	78500 86534**	88500 86534**	81500 86534**
-	Reliable	-	-	-	420*
-	Penn-Union	DQ2A-026**	DQ2A-026**	DQ2A-026**	-
1437	ITE (Victor)	5011 52101**	4060 1655	4060 2050	4060 2050

* Clamp furnished with liner--does not require tape.
** Aluminum clamp--does not require liner or tape.

p - Connectors
Copper Type Conductors

	Copper to Guy Strand	Long Connectors Copper to Copper		
		2	4	6
Anderson Elec.	LC-511A	C-2-L	C-4-L	C-6-L
Blackburn	2HPW (1/4") 1/0HPW (3/8") PAC7	2H3	4H3	6H3
Burndy	UC8W26L	KS-22-3	KS-20-3	KS-17-3
C & R	CRJC-1			
Dossert	UDV 13-1-P	DS5-3	DS3-3	DS2-3
Fargo	GC-8040P			
Joslyn	438ALC		4F	6F
Kearney	9968-1	118107	118105	118103
Krueger & Hudepohl	UC58B-EV			
Penn Union	JC-1-AC (1/4", 3/8" guy strand) (1/0 strand copper max.)	SEL-3S	SEL-4S	SEL-6S
Reliable	438ALC		4F	6F
Sherman	R-12		TSS-4	TSS-6
Weaver	K-1	2W3	4W3	6W3

p - Connectors, service

Aluminum-to-Aluminum

Solid or Stranded

	No. 2	No. 4
ALCOA	490.0	490.0
Anderson Elec.	LC-51A	LC-51A
Bethea/National	APG-1	APG-1
Blackburn	PAA2	PAA2
Burndy	UC25R2R	UC25R2R
Fargo	GA-620	GA-620
Joslyn	AL24KK	AL46KK
Penn-Union	PCAA-10BF	PCAA-10BF
Reliable	AL24KK	AL46KK
Weaver	NICA2	NICA2

z - Anchors, Expanding and Plate

DISTRIBUTION

Rating - lbs.		6000	8000	10,000	12,000
Min. Area - sq. in.		90	100	120	135
Rod Dia. - inches		5/8	5/8	3/4	3/4
Rod Length - feet		7	7	8	-
	Type				
Chance	8 way	-	88115-G	88135-G	88135-G
	Plate	-	617-G	-	-
Dixie	4 way	D88100-G	D88115-G	D88135-G	D88135-G
	Plate	-	D7502-G	-	D7504-G
Everstick	3 way	834	836	8310	-
	4 way	-	-	84-3/4	-
Grip-Tite	8 way	A322086G	A322088G	A322812G	A322812G
Joslyn	8 way	J8100-G	J8115-G	J8135-G	J8135-G
	Plate	-	J7502-G	J7503-G	J7504-G
McGraw-Edison	4 way	DA1E5	DA1E6	DA1E6	DA1E7
	Plate	DA1P7	DA1P8	DA1P9	DA1P10
Oliver	8 way	-	G084115	G084135	G084135
Power Line Hardware	8 way	PLHG-1008	PLHG-1158	PLHG-1358	PLHG-1358
South Central	8 way	-	84115AG	84135AG	84135AG
Utilities Service	8 way	C88100-G	C88115-G	C88135-G	C88135-G
	Plate	-	C617-G	C622-G	C822-G

NOTE: Where galvanized anchors are listed, the same anchors ungalvanized (black asphalt coated) are also acceptable.

z - Anchors, plate

Applicable Specification: "REA Specification for Steel Plate Anchors," T-3

TRANSMISSION

Minimum Area 400 sq. in.

Chance	X24 - 3/4 - G
Grip-Tite	XP24 - 3/4 - G
Joslyn	J3524 - 3/4 - G
McGraw-Edison	DA4P7 - 3/4 - G
Power Line Hardware	PLHG-24-3/4

NOTE: Where galvanized anchors are listed, the same anchors ungalvanized (black asphalt coated) are also acceptable.

af - Cutouts, distribution, open

Manufacturer	Type	Voltage Rating
Chance	F3	15, 27 kV
General Electric	9F34A	15, 27
Joslyn	Series 2	15, 27
Kearney	HX (With or without loadbreak accessory)	15, 27
McGraw-Edison	S1	15, 27
	ELB	15, 27
S & C Electric	XS	15, 27
Southern States	Series 63	15, 27
	Series 70	15
Westinghouse	NCX	15
	LDX	27
	LBU	15, 27

NOTE: The buyer should specify the load rating, voltage rating, interrupting rating and required accessories.

af - Cutout, open-link fuse support

Manufacturer	Mounting	7.2/12.5 kV 50 amp.	14.4/24.9 kV 50 amp.
Joslyn	Crossarm	J9254-6	J9264-6
Kearney	Crossarm	6484-55	-
	Bushing	6486-4	-
McGraw-Edison	Crossarm	FT1A2	FT1A4
	Bushing	FT10A3	-
RTE	Crossarm	41S3	41S6

Note: Items listed on this page are fuse supports only and have no inherent interrupting capacity. They should be used with fuse links capable of interrupting at least 1200 amperes and for transformer protection only.

ah - Tie, insulator, formed type

Manufacturer	Meeting No. and Date	Conditions
Chance		
Tygard Type AWTY-56* (Side tie for use over armor rod on spool insulator with 1-3/4" groove)	863 4/13/67	To obtain experience.
Top tie Type AWTT (For use over armor rod. Order for specific conductor size and insulator.)	886 2/8/68	To obtain experience.
Preformed Line Products		
Spool Tie for ACSR, Type SPL* (Side tie for use on spool insulator with 1-3/4" groove)	877 9/14/67	To obtain experience.
DST double support top tie (Order for specific conductor size and insulator)	978 10/28/71	To obtain experience.
DBST double side tie (Order for specific conductor size and insulator)	1057 1/23/75	To obtain experience.

*Not for side mounting on pin or post insulators.

ai - Rods, ground

Applicable Sizes: The standard size is 5/8 inch x 8 feet and catalog numbers listed below are for this size. Larger sizes may be required for special conditions.

Copper-covered steel rods

Boggs	EB810
Burndy	858-RGR
Carolina Galvanizing	CR-588
Copperweld	GR588
Hubbard	9438
ITT Blackburn	6258
Joslyn	J8338
Kortick	K5428
Knight	R858
Oliver	79438
Teledyne (Penn-Union)	GR-588
UTM	858PP
Utilities Service	6617
Weaver	W588

Stainless Clad Steel

Manufacturer	5/8"	3/4"
Joslyn	J5374	J5377
Porcelain Products	9438	9448
Teledyne (MEFCO)	"PERMAGROUND"	"PERMAGROUND"

ai - Rods, ground

Applicable sizes: The standard size is 5/8 inch x 8 feet and catalog numbers listed below are for this length. Longer rods may be required for special conditions.

Hot Dip Galvanized Steel

Manufacturer	5/8"	3/4"
Boggs	G588	G348
	PTG588**	PTG348**
Burndy	G588GR	--
Carolina Galvanizing	R588	R688
Chance	8578	8618
	C203-0107**	C203-0109**
Dixie	D8578	D8618
Galvan	GR6258	GR7508
General Electric	0982-00002	0982-00003
Hubbard	9578	9618
Joslyn	J3358B*	J3458B*
	J5328	J5338
	J5228**	J5238**
Knight	G-588	G-348
	G-588PT**	G-348PT**
Kortick	K4658	K4678
Lloyd	6258H	7508H
McGraw-Edison	DN5S8	DN6S8
	DN8D*	--
Oliver	9318	9328
	49368*	49378*
Porcelain Products	7338	7348
Utilities Service	5307	6338
Weaver	8480G	8340G

Electro-Galvanized Steel

LMP	6258E**	7508E**
Power Line Hardware	PLH-588	PLH-348

Stainless Steel

Joslyn	23821	23822
Teledyne (MEFCO)	TDY Sol	TDY Sol

* Rod furnished with clamp.
** Rod furnished with 4 ft., No. 6 tinned or galvanized copper pigtail.

ai - Rods, ground, sectional

Galvanized steel and
copper-covered steel

Sectional Ground Rods

Manufacturer	8' long	10' long	Couplings	Driving studs
Blackburn	6258S	6260S	60C	60DS
Carolina Galv.	SR588	SR510	CR58	DS58
Chance Galv. Steel	-	8512	8611	-
Copperweld	GRS588	GRS5810	GRC58	GRB58
Hubbard Galv. Steel	29438 69608	29440 69610-I	9534 69611	29534 29534
Joslyn Galv. Steel	J9158 J23282.8	J9160 J23282.10	J9182 J23282A	J9186 J9186
Knight	S858	S1058	SC58	DS58
Kortick	K5441	K5443	K5482	K5492
McGraw-Edison Galv. Steel	DN17S8	DN16S10	DN1K2	
Oliver Galv. Steel	729438 9175	729440 9183	79534 9180	729534 9179
Weaver	W-588T	W-5810T	158C	358D

aj - Clamp, ground rod

Manufacturer	For 5/8" Copper-covered Rod	For 3/4" Galv. or Stainless Steel Rod	For 5/8" Galv. or Stainless Steel Rod
Anderson	GC-5	-	-
Blackburn	G5	-	-
Boggs	G31	-	-
Burndy	GKP635	-	-
C & R Products	CRGC-58	-	-
Copperweld	ABH58	-	-
Dossert	GNL62H	-	-
*Erico (Cadweld)			
1 ground wire	S-3087-E	S-2901-E	S-3087-E
2 ground wires	S-3183-E	S-2917-E	S-3183-E
Hubbard	6530	-	-
Ilsco	GRC-58	-	-
Joslyn	J8392AB	R3459	R3459
Krueger & Hudepohl	808	-	-
Kortick	K4647	-	-
Oliver	76492	-	-
O-Z Elec. Mfg.	BG0304	-	-
Penn-Union	CEB-2	-	-
Reliable	E58	3459	3459
UTM	910-023-03	910-007-02	910-007-02
Weaver	WB5/8	-	-

*Includes disposable molds.

Conditional List
aj
July 1977

aj - Clamp, ground rod

Manufacturer	Meeting No. and Date	Conditions
Kearney 18457 ("Squeezon," 5/8 inch)	467 5/6/52	To obtain experience.
Power Line Hardware RC-34 (for 5/8" and 3/4") galvanized or stainless steel ground rod	1114 5/12/77	To obtain experience.

an - Transformers, distribution, pole type
Primary Voltages 7.2/12.5, 7.62/13.2 and 14.4/24.9 kV

Applicable Specifications: "REA Specifications for Rural Distribution Transformers," D-10

Listing is by type rather than by catalog number because of the many possible combinations of voltage, kVA and taps and protective equipment.

	7.2/12.5 & 7.62/13.2	14.4/24.9	Dual Voltage
Arkansas Electric Cooperative			
Conventional, single bushing	ASE		
Central Moloney			
Conventional, single bushing	AOD	AOD	AOD
Conventional, two bushing	AOD	AOD	AOD
Self-protected, single bushing	DVP	DVP	DVP

The single bushing transformer may also be obtained with bushing mounted cutout and lightning arrester, and with internal fuse and double gap.

ERMCO	
Conventional, single bushing	CONV
Conventional, two bushing	CONV
Self-protected, single bushing	CSP

The single bushing transformer may also be obtained with double gap and internal fuse (Type DG) or lightning arrester and external cutout (Type COLA).

Dead-front for use in enclosure: Add "R" (Radial) or "LF" (Loop feed) to designation.

an - Transformers, distribution, pole type
Primary Voltages 7.2/12.5, 7.62/13.2 and 14.4/24.9 kV

	7.2/12.5 & 7.62/13.2	14.4/24.9	Dual Voltage
General Electric			
Conventional, single bushing	HS	HS	HS
Self-protected, single bushing	HSBA Rural	HSBA Rural	HSBA Rural
Conventional, two bushing	HS	HS	HS
Type HS may also be obtained with internal fuse, with internal fuse and double gap (Type HSGF), and with bushing mounted cutout and lightning arrester (Type HSA).			
Howard Industries			
Conventional, single bushing	REC-C	REC-C	REC-C
Conventional, two bushing	Conv-2B	Conv-2B	Conv-2B
Self-protected, single bushing	REC-P	REC-P	REC-P
Kuhlman			
Conventional, single bushing	I	I	I
Conventional, two bushing	B	B	B
Self-protected, single bushing	H	H	H
Type I may also be purchased with internal fuse, with internal fuse and double gap (Type G), and with bushing mounted cutout and lightning arrester (Type J).			
McGraw-Edison			
Conventional, single bushing	G	G	GD
Self-protected, single bushing (with open-gap valve arrester)	L	L	LD
Conventional, two bushing	E	E	ED
Type G may also be obtained with internal fuse, with internal fuse and double gap, and with bushing mounted cutout and lightning arrester.			
Self-regulating, single phase (5 through 25 kVA).	SRT	SRT	

an - Transformers, distribution, pole type
Primary Voltages 7.2/12.5, 7.62/13.2 and 14.4/24.9 kV

	7.2/12.5 & 7.62/13.2	14.4/24.9	Dual Voltage
NECO			
Conventional, single bushing	NC	NCH	
Self-protected, single bushing	NC-1	NCHCB	
Type NC may also be obtained with double gap and internal fuse (NC-2) and with arrester and open link fuse (NC-3).			
H. K. Porter (Delta-Star)			
Conventional, single bushing	OS-B3	OS-B3	OS-B3
Self-protected, single bushing	OSP-B3	OSP-B3	OSP-B3
Conventional, two bushing	OS-A	OS-A	OS-A
Types OS-B3 and OS-A may also be obtained with internal fuse.			
RTE			
Conventional, single bushing	1T	5T	96T & 733T
Self-protected, single bushing	230T & 234T	276T & 284T	336T & 781T
Conventional, two bushing	2T	6T & 8T	94T and 290T
Conventional single bushing type may also be purchased with external overload protection and double gap and with bushing mounted cutout and lightning arrester.			
Rural Electric Supply Cooperative			
Conventional, single bushing	CONV		
Conventional, two bushing	CONV		
Self-protected, single bushing	CSP		
The single bushing transformer may also be obtained with double gap and internal fuse (Type DG) or lightning arrester and external cutout (Type COLA).			
Dead-front for use in enclosure:	Add "R" (Radial) or "LF" (Loop Feed) to designation		
Dowzer			
Conventional, single bushing	CR		
Self-protected, single bushing	CSP-R		
Conventional, two bushing	CD		

an - Transformers, distribution, pole type
Primary Voltages 7.2/12.5, 7.62/13.2 and 14.4/24.9 kV

	7.2/12.5 & 7.62/13.2	14.4/24.9	Dual Voltage
United (Ky. AEC)			
Conventional, single bushing	SC	SC	DSC
Conventional, two bushing	SC	SC	DSC
Self-protected, single bushing	SCP	SCP	DSCP

SC and DSC may be purchased with external fuse and arrester (SP and DSP)

VanTran	
Conventional, single bushing	CR
Self-protected, single bushing	CSP-R
Conventional, two bushing	CD

an - Transformers, Power
Single-Phase, Step-Down
for Distribution Substation Use

Primary Voltage-kV	kVA Capacity												
	167	250	333	500	833	1250	1667	2500	3333	5000	6667	8333	10,000
Kuhlman													
34.4			X	X	X	X	X	X					
43.8			X	X	X	X	X	X	X				
67.0				X	X	X	X	X	X				
115									X				
McGraw-Edison													
34.4	X	X	X	X	X	X	X						
43.8				X	X	X	X						
67.0			X	X	X	X	X						
Standard													
34.4			X	X	X								
43.8		X	X	X	X								
67.0		X	X	X	X								
Wagner													
34.4	X	X	X	X	X	X	X						
43.8		X	X	X	X	X	X						
67.0		X	X	X	X	X	X						
115											X		
138											X		
Westinghouse													
34.4					X	X	X	X	X				
43.8					X	X	X	X	X				
67.0					X	X	X	X	X				
115											X		

an - Transformers, Power
Three-Phase, Step-Down
for Distribution Substation Use

Primary Voltage-kV	kVA						MVA							
	750	1000	1500	2000	2500	3750	5	7.5	10	12	15	20	25	30
Central Moloney														
34.4	X	X	X	X	X	X	X	X						
43.8	X	X	X	X	X	X	X	X	X					
67.0	X	X	X	X	X	X	X	X	X					
General Electric														
34.4	X	X		X	X	X	X	X	X	X	X	X		
43.8	X	X		X	X	X	X	X	X	X	X			
67.0	X	X		X	X	X	X	X	X	X	X	X	X	
115							X	X	X	X			X	
138							X		X	X	X	X	X	

Transformers 5 MVA and larger also accepted as load tap changing transformers using General Electric Types LR72, LR65 and LRT-200 load tap changers.

Kuhlman														
34.4					X	X	X	X	X	X	X			
43.8						X	X	X	X					
67.0					X	X	X	X	X	X	X	X		
115							X		X	X	X			

Transformers 5 MVA and larger also accepted as load tap changing transformers using Allis Chalmers Types TLS and TLH-21 load tap changers.

an - Transformers, Power
Three-Phase, Step-Down
for Distribution Substation Use

Primary Voltage-kV	kVA						MVA							
	750	1000	1500	2000	2500	3750	5	7.5	10	12	15	20	25	30
McGraw-Edison														
34.4		X		X	X	X	X	X	X	X				
43.8		X		X	X	X	X	X	X	X				
67.0		X		X	X	X	X	X	X	X				
115										X	X			
138											X	X		

Transformers 5 MVA and larger also accepted as load tap changing transformers using McGraw-Edison Types 550, 550B and 550C load tap changers.

Wagner														
34.4		X			X	X	X	X	X					
43.8					X	X	X	X	X					
67.0					X	X	X	X	X					
115										X	X		X	X
138										X	X	X	X	X

Westinghouse														
34.4		X		X	X	X	X		X				X	
43.8		X		X	X	X	X	X	X	X	X			
67.0	X	X		X	X	X	X	X	X	X	X	X		
115								X	X	X	X	X	X	
138										X	X	X	X	

Transformers 5 MVA and larger also accepted as load tap changing transformers using Westinghouse Types UTS-A and UTT-B load tap changers.

Conditional List
an(1.1)
January 1978

an - Transformers, Distribution, Pole Type

Manufacturer	Meeting No. and Date	Conditions
ERMCO		
14.4/24.9 kV and dual voltage	1095 8/11/76	To obtain experience.
Conventional, single bushing		
Conventional, two bushing		
Self-protected, single bushing		
The single bushing transformers may also be obtained with double gap and internal fuse (Type DG) or lightning arrester and external cutout (Type COLA). Dead-front for use in enclosure: Add "R" (Radial) or "LF" (Loop-feed) to designation.		
Magnetic Electric		
7.2/12.5, 7.62/13.2 and 14.4/24.9 kV	1097 9/9/76	To obtain experience.
Conventional, single bushing	1104 (12/16/76)	
Self-protected, single bushing		
Conventional, two bushing		
SESCO		
7.2/12.5 kV and 7.62/13.2 kV	1018 6/7/73	To obtain experience.
Conventional, single bushing Type RU		
Self-protected, single bushing Type ESP		
Conventional, two bushing Type CONV		
Type RU may also be purchased with internal fuse and/or lightning arrester.		
Dowzer		
14.4/24.9 kV and Dual Voltage	824 8/19/65	To obtain experience.
Conventional, single bushing Type CR	1011 3/1/73	
Self-protected, single bushing Type CSP-R		
Conventional, two bushing Type CD		

an - Transformers, Distribution, pole type

Manufacturer	Meeting No. and Date	Conditions
Tarrant		
7.2/12.5 kV and 7.62/13.2 kV	791 4/30/64	To obtain experience.
Conventional, single bushing Type CB-1 Conventional, two bushing Type CB-2 Self-protected, single bushing Type SG-1		
May also be obtained with lightning arrester and internal fuse. Types PSG-1 and PSG-2.		
VanTran		
14.4/24.9 kV and Dual Voltage	1075 10/16/75	To obtain experience.
Conventional, single bushing Type CR	1095 8/11/76	
Conventional, two bushing Type CD		
Self-protected, single bushing Type CSP-R		

an - Transformers, Power
Single-Phase, Step-Down
for Distribution Substation Use

Condition of Acceptance: To obtain experience.

Transformers with 115 kV and 138 kV primary voltage ratings are acceptable with full BIL and with one step reduced BIL.

"X" indicates that acceptable test data have been furnished REA for this rating and for secondary voltages in either 15 kV or 25 kV class.

"s" indicates that performance specifications have been furnished REA and test data are to be submitted when available.

Primary Voltage-kV	kVA Capacity												
	167	250	333	500	833	1250	1667	2500	3333	5000	6667	8333	10,000
ESCO													
34.4	X			X	X								
Fed. Pacific													
34.4							X						
67.0	s	s	s	s	s	s	s			X			
General Electric													
43.8	s									s			
115												s	s
Hevi-Duty													
34.4					X	X	X	X	s	s	s	s	s
43.8					s	s	X	X	s	s	s	s	s
67.0					s	X	X	X	X	s	s	s	s

an - Transformers, Power
Three-Phase, Step-Down
for Distribution Substation Use

Condition of Acceptance: To obtain experience.

Primary Voltage-kV	kVA						MVA							
	750	1000	1500	2000	2500	3750	5	7.5	10	12	15	20	25	30
Central Moloney														
34.4									s					
Federal Pacific														
34.4	s	s		s	s	X	s	s	s					
67.0	s	s	s	s		s	X	s	s	X	X	X	X	
115										X	X		X	X
138										X			X	X

Transformers 5 MVA and larger also accepted as load tap changing transformers using Federal Pacific Type TC-546 load tap changers.

General Electric														
34.4													s	s
43.8												s	s	s
67.0														s
115											s	s		s
138								s						s

Transformers 5 MVA and larger also accepted as load tap changing transformers using General Electric Types LR72, LR65 and LRT-200 load tap changers.

Conditional List
an(3.1)
October 1977

an - Transformers, Power
Three-Phase, Step-Down
for Distribution Substation Use

Condition of Acceptance: To obtain experience.

Primary Voltage-kV	kVA						MVA							
	750	1000	1500	2000	2500	3750	5	7.5	10	12	15	20	25	30
Hevi-Duty														
34.4	s	s	X	s	s	X	X	X	s	s	X	s	s	s
43.8	s	s	s	s	s	X	X	X	X	X	s	s	s	s
67.0					s	X	X	X	X	X	s	X	s	s
115							X	X	X	X	s	s	s	s

Transformers 5 MVA and larger also accepted as load tap changing transformers using Westinghouse Types UTS-A and UTT-B and Allis-Chalmers Type TLS load tap changers.

McGraw-Edison														
34.4	s		s								s	s	s	s
43.8	s		s								s	s	s	s
67.0	s		s								s	s	s	s

Transformers 5 MVA and larger also accepted as load tap changing transformers using McGraw-Edison Types 550, 550B and 550C load tap changers.

H. K. Porter (Delta-Star)														
34.4	s	s	s		s	X	X	X	s					
43.8			s	s	s	X	X	X	s	X				
67.0		s	X	s	X	X	X	X	X	X	X			
115							X	X	s	X	X			

an - Transformers, 2:1 Ratio, Single Phase, Autotransformers or Two-Winding Transformers for Use in System Voltage Conversion

All transformers are warranted by the manufacturer to withstand a short circuit of twenty-five (25) times rated current or to be self-protecting under short circuit (SP).

Condition of Acceptance: To obtain experience.

Manufacturer	Designation	Size	Short circuit duty
General Electric			
2-WND	HS STEP	167-500	SP
AUTO	HS STEP	167-1000	25
Westinghouse			
2-WND	"Jumbo"	167-500	SP
H. K. Porter (Delta-Star)			
2-WND	LTD	167-500	SP

ao
July 1977

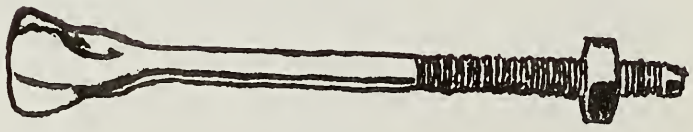
ao - Bolt, straight, thimble type eye

Applicable Specifications: Edison Electric Institute
Specification TD-4 1958,
"Specifications for Eye Bolts"

Applicable Sizes : 5/8 inch, 6 through 12 inch length
3/4 inch, 8 through 12 inch length

The following manufacturers have shown compliance with the applicable specifications:

A. B. Chance Company
Dixie Electrical Manufacturing Company
Hubbard and Company
Joslyn Mfg. and Supply Company
Kortick Manufacturing Company
*McGraw-Edison
Oliver Electrical Mfg. Company
Utilities Service Company



*"Static proof" designs available.

ap - Clamp, hot line
Copper and Copperweld-copper Conductor

Conductor Size Copper Copperweld-copper	2/0	1/0 2A	2 thru 6 4A thru 8A
Blackburn **Bodendieck**	**PGH3** 425CC	**PGH3** 425CC	**PGH3** 425CC
Fargo	GH-209	GH-209	GH-209
Weaver	IWS	IWS	IWS

Clamps listed below have springs and enclosed thread chambers. They are recommended for use in areas where severe corrosion or vibration trouble is experienced.

Anderson	BH-00	BH-00	BH-00
Bodendieck	780CC	780CC	775CC
Chance	S1530CC	S1520CC	S1520CC
Electrical Specialty	BHC	BHC	BHC
Fargo	GH-101	GH-101	GH-100
Ideal	3532	3532	3532
Penn-Union	HLC-020-LS	HLC-020-LS	HLC-020-LS

ap - Clamp, hot line
ACSR with armor rods

Conductor Size	Tap Conductor	4/0 & 3/0	2/0	1/0	2 & 4
Anderson	Aluminum	HL-9	HL-7	HL-5	HL-3
Bodendieck	Aluminum	-	-	731AA	731AA
	Copper	-	-	731AC	731AC

Clamps listed below have spring action and enclosed thread chambers. They are recommended for use in areas where severe corrosion of vibration trouble is experienced.

Conductor Size	Tap Conductor	4/0 & 3/0	2/0	1/0 & 2	4
Anderson	Aluminum	HLP-7	HLP-7	AH-4	AH-4
Bodendieck	Aluminum	-	-	9051AA	9051AA
	Copper	-	-	9051AC	9051AC
Chance	Aluminum	S1540-AA	S1540-AA	S1530-AA	S1530-AA
	Copper	S1540-AC	S1540-AC	S1530-AC	S1530-AC
Fargo	Aluminum	GH-102A	GH-102A	GH-101A	GH-101A
	Copper	GH-102AC	GH-102AC	GH-101AC	GH-101AC
Weaver	Aluminum	W-1066AA	W-1066AA	W-6336AA	W-6336AA
Utilco	Aluminum	-	HLC-397	-	HLC-40

bk
January 1978

bk - Guy plate

Applicable Specifications:

Strain Type: Edison Electric Institute Specification TD-11 1951, "Specifications for Guy Hooks and Guy Strain Plates"

Lift Type : None

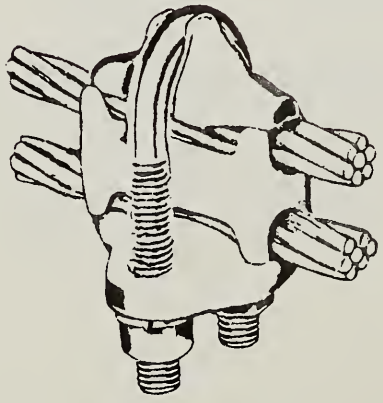
	Strain Type 4" x 8" x 14 gauge	Lift Type 2½" x 7" x ¼", 2 hole
Chance	6575	7898
Dixie	D6575	D7888
Hubbard	7575	8888
Joslyn	J1034	J7894
Kortick	K4015	K3511
McGraw-Edison	DG1M2	DG4M2
Oliver	9050	6967
Power Line Hardware	GSP-1	
Utilities Service	5351	C434

bn
October 1977

bn - Clamp, loop deadend

For ACSR

	3/0	2/0	1/0	2	4
ALCOA	-	413	413	412	411
Anderson	LC-74B	LC-72B	LC-71-B	LC-70-B	LC-70B
Bethea/National	ALD-7373-U	ALD-34-U	ALD-1313-U	ALD-1313-U	ALD-1313-U
Blackburn	DLC23	DLC60	DLC61	DLC62	DLC62
Burndy	-	-	UW25R	UW2R	UW2R
C & R	-	-	CRLD-10	CRLD-10	CRLD-10
Fargo	GA-145	GA-145	GA-144	GA-144	GA-144
Joslyn	-	-	J1414	J1411	J1411
Penn Union	ADCL-040	ADC-11	ADC-10	ADCL-013	ADCL-C1
Weaver	-	-	WDE-10	WDE-2	WDE-2



bu - Connector, grounding
for transformer or other equipment

Manufacturer	Copper Alloy[1]	Plated Copper Alloy[2]	Aluminum Alloy[3]
Anderson		GTCL-23A-TP	
Blackburn, ITT		TTC2P	
Burndy		EQC632C-TN	
Dossert		TGC-8-50-SN	
Fargo	GC-207		GA-220
Penn-Union		GSE-C1TN	
Weaver		TGC-2P	

1 - For use with only copper type ground wire.

2 - For use with both copper and aluminum type ground wire.

3 - For use with only aluminum type ground wire.

bv, Rods, armor

Aluminum or aluminum alloy rods for use on ACSR

ALCOA	Straight Formed Type
Blackburn	Formed Type
Chance	Formed Type
Helical Line Products	Formed Type
Preformed Line Products	Formed Type
Southwire	Straight

Copperweld rods for copper or CWC conductor

Chance	Formed Type
Helical Line Products	Formed Type
Preformed Line Products	Formed Type

Alumoweld rods for aluminum clad steel (Alumoweld) overhead ground wire

Chance	Formed Type
Helical Line Products	Formed Type
Preformed Line Products	Formed Type

Bronze rods (10 inch length) for jumper protection

Preformed Line Products	Formed Type

cg - Switch, air, three-pole, group-operated
NEMA standard switches for station and line structures

Manufacturer	Acceptable Mounting on Structure	Tilting Ins. Type	kV	Vertical Break Type	kV	Side Break Type	kV	Center Break Type	kV	Double Break Type	kV
Allis Chalmers	Horizontal			TA	15-345	SSB	15-138	DSB CBL	46-345 115-230		
PSE Inc. (Chance)	Horizontal Phase over phase					SMH(VL) GOABS(VL)	34.5-69 15-69				
I-T-E	Horizontal	3ST	15-34.5	TTR6	15-161						
Johnson	Horizontal			VIP	15-230	LS	15-69	M	15-230		
Joslyn (Hi-Voltage)	Horizontal "			RF-2	15-230	RB-1(VL) RB-1*	15-25 15-115				
Kearney	Horizontal	NE-2	15-34.5	AR	60-P 15-69						
MEMCO	Horizontal "	AgF AgC	15-69 15-69	EA	15-345						
H. K. Porter (Delta-Star)	Horizontal			MK-40	15-69	PMB-40A	15-69	LPC	69-230		

(L) Means gas or solid material full-load interrupters are accepted and available.
(VL) Means vacuum full-load interrupters are accepted and available.

* These switches may be purchased with reduced voltage vacuum interrupters and may be applied for loop sectionalizing duty when peak recovery voltage does not exceed 25 kV.

NOTE: Vertical phase-over-phase mounted switches are not acceptable above 25 kv class unless equipped with full-load interrupters. Switches of 15 kV and 25 kV classes with individual phases mounted on wood crossarms must be supplied with insulated interphase and control rods.

cg - Switch, air, three-pole, group-operated
NEMA standard switches for station and line structures

Manufacturer	Acceptable Mounting on Structures	Tilting Ins. Type	kV	Vertical Break Type	kV	Side Break Type	kV	Center Break Type	kV	Double Break Type	kV
Powerdyne (Kearney)	Horizontal							V1-V4	34.5-230		
Royal	Phase over Phase					RG-63	15-23				
	Horizontal	AL-2	15-46	RVL	15-161	RSL	15-161	ZAD	34.5-230		
	Horizontal	AL	15-46	RVL-61	15-230	RSL-L	15-69				
S & C	Horizontal			Alduti(L)	15-34.5	Alduti(L)	15-25			Alduti(L)	34.5-46
	Phase over phase			Alduti(L)	15-25	Alduti(L)	15-25			Alduti(L)	34.5-46
	Vertical			Alduti(L)*	15-34.5	Alduti(L)	15-25			Alduti(L)*	34.5-46
Southern States	Horizontal			WAG	15-230	57K	15-69				
Turner	Phase over phase					(1D,2D,3D)(VL)	15-161				
	Horizontal					1D(VL)	15-161				
USCO	Horizontal			AGT(VL)**	15-230	GSH-4(VL)	15-138	AGCH**	15-230		
	Horizontal							AGCH-V**	34.5-230		
	Phase over phase					GSH-4(VL)	15-138	GCH	15-23		

(L) Means gas or solid material full-load interrupters are accepted and available.
(VL) Means vacuum full-load interrupters are accepted and available.
* These switches, except 34.5 kV Alduti vertical break, are available and accepted in combination with the S & C Type SMD substation fuse cutouts listed on page af-3.
** Also available in bronze.
NOTE: Vertical phase-over-phase mounted switches are not acceptable above 25 kV class unless equipped with full-load interrupters. Switches of 15 kV and 25 kV classes with individual phases mounted on wood crossarms must be supplied with insulated interphase and control rods.

cg - Switch, air, three-pole, group-operated

(Not suitable for substation use)

Manufacturer	Acceptable Mounting	Vertical Break Type	kV	Side Break Type	kV	Center Break Type	kV
KPF	Horizontal			A202-A208	15-110		
	Phase-over-phase			A202	15-23		
	" " "			W202	15-23		
	" " "			MD202	15-23		
Westinghouse	Horizontal	LB-3(L)	15				
Powerdyne (Kearney)	Horizontal					A,B,V1	15-23
	Phase-over-phase					A,V1	15-23

(L) Means gas or solid material full-load interrupters are accepted and available.

(VL) Means vacuum full-load interrupters are accepted and available.

NOTE: Switches of 15 kV and 25 kV classes with individual phases mounted on wood crossarms must be supplied with insulated interphase and control rods.

cg - Switch, air, three-pole, group-operated (Factory Preassembled)

Manufacturer	Acceptable Mounting on Structures	Vertical Break Type kV	Side Break Type kV
Chance	Horizontal (A)		D4,D5(L)15-27
	Phase over phase (A)		D4,D5(L)15-27
S & C	Horizontal (A)		Alduti(L)15-25
	Vertical (A)		Alduti(L)15-25
	Phase over phase (B)	Alduti(L) 34.5 (200 kV BIL)#	
	Vertical (B)	Alduti(L) 34.5 (200 kV BIL)#	

(L) Means gas or solid material full-load interrupters are accepted and available.

Accepted for transmission use only, provided the steel crossarm base is grounded with an adequate grounding connector.

(A) Not suitable for substation use.

(B) NEMA standard switches for station and line structures.

NOTE: Switches with factory-assembled crossarm type bases must have nonconducting crossarm type bases, nonconducting braces, and insulated interphase and control rods, except as otherwise noted.

cg - Switch, air, three-pole, group-operated

Manufacturer	Meeting No. and Date	Conditions
Southern States		
"Pole-Pak" 15-23 kV	800 8/20/64	To obtain experience.
Type EV, horizontal mounted, vertical break, 15-230 kV 600-1200 amp.	859 2/9/67	To obtain experience.
Type ES; 15, 23 and 34.5 kV (horizontal upright models only)	897 7/11/68	1. To obtain experience. 2. For 15 kV and 23 kV distribution lines: insulated interphase and control rod spacers required. See REA Drawings M3-15 and VM3-16. 3. NEMA insulators and steel interphase base required for transmission line structure as in TM-3. 4. Acceptable on steel substations 15 through 34.5 kV with NEMA insulators and uninsulated interphase rods.
Type 57L sidebreak, 115-161 kV, 600 and 1200 amp., horizontal upright	1067 6/12/75	To obtain experience.
H. K. Porter		
Type MK-40A 15 kV thru 230 kV (horizontal upright mounting)	912 2/20/69	1. To obtain experience. 2. Insulated interphase and control rods required on 15 kV and 23 kV models used on wood structures. 3. Steel interphase base required when mounted as in REA Drawing TM-3.

ck - Clamp, anchor rod bonding

For Standard and Drive Type Rods

Diam. of Rod	Type of Eye	5/8"	3/4"	1"
C & R Products	Single	CRBC-1	CRBC-1	CRBC-1
	Twin	CRBC-2	CRBC-2	CRBC-2
	Triple	-	CRBC-3	CRBC-3
Chance	Single	G5060	G5060	G5060
	Twin	G5061	G5061	G5061
	Triple	-	G5063	G5063
Dixie	Single	D3143	D3143	D3143
	Twin	-	D3144	D3144
	Triple	-	D3145	D3145
Hubbard	Single	4244	4244	-
	Twin	-	4245	4245
	Triple	-	4246	4246
Joslyn	Single	3230	3230	3230
	Twin	-	3231	3231
	Triple	-	3233	3233
Kortick	Single	K3147	K3147	-
	Twin	-	K3148	K3148
	Triple	-	K3149	K3149
McGraw-Edison	Single	DA1B1	DA1B1	DA1B1
	Twin	DA2B1	DA2B1	DA2B1
Oliver	Single	9123	9123	9123
	Twin	-	9122	9122
Utilities Serv.	Single	CG5060	CG5060	-
	Twin	-	CG5061	CG5061
	Triple	-	CG5063	CG5063

For Power Installed Screw Anchors

C & R Products	Single	CRBC-4	CRBC-5	-
Chance	Single	G5067	G5068	-
Joslyn	Single	PIBC-4	PIBC-5	-

cm
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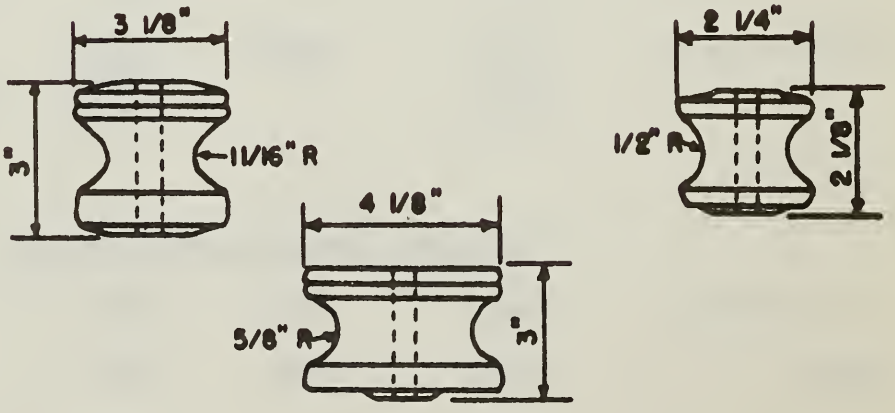
cm - Insulator, spool

Type:	Secondary (Wet Process)		Service	
			Wet Process	Dry Process
Groove Diameter:	1-3/4"	3"	1-3/8"	1-3/8"
Chance	C909-0032	C909-0034	C909-0031	0606
Hubbard	455	1716	1706	1606
Hughes	2102	-	-	-
I-T-E (Victor)	2012	2026	2011	-
Joslyn	J151	J0101	J150	J100
Kortick	K516	K522	K513	K514
McGraw-Edison	DE4S3	DE5S1	DE2S2	DE2S1
Oliver	2100	2104	2400	2300
Porcelain Prod. (Knox)	310	306	303W	300D
Universal	1082	-	-	-
Utilities Service	205	31221	208	207



ei - Clamps, suspension with socket eye

ACSR with Straight or Formed Armor Rods

Iron or Steel Clamps

	AWG			kcmil					
	1/0 & 2/0	3/0	4/0	266.8	336.4	477	556.5	795	954
Anderson	MS-82-S	-	MS-104-N	MS-104-N	-	-	-	-	-
Barron Bethea	FGW-4S	-	-	-	-	-	-	-	-
Bethea/National	FS-83-S	-	-	-	-	-	-	-	-
I-T-E (Victor)	6203	6204	6204	6205	6255	6257	-	-	-
Joslyn (Brewer-Titchener)	6203	6204	6204	6205	6255	6257	-	-	-
Knox	6203A-U	6204A-U	6204A-U	6205A-U	6255A-U	6257A-U	-	-	-
Lapp	9203	9204	9204	9205	9205A	9207A	-	-	-
Locke	46203A-U	46204A-U	46204A-U	46205A-U	46255A-U	46257A-U	-	-	-
Ohio Brass	83085	83105	83105	83115	83125	83145	-	-	-

ACSR with Straight or Formed Armor Rods

Aluminum Alloy Clamps

	AWG		kcmil					
	1/0 & 2/0	3/0 & 4/0	266.8	336.4	477	556.5	795	954
Anderson	HAS-85-S	HAS-104-S	HAS-104-S	HAS-118-S	HAS-139-S	HAS-147-S	HAS-182-S	HAS-182-S
Bethea/National	LS-1-S	LS-2-S	LS-3-S	LS-4-S	LS-6-S	-	-	-
C & R	CRSC-1S	CRSC-2S	CRSC-2S	CRSC-3S	-	-	-	-
I-T-E (Victor)	9503-U	9504-U	9504-U	9505-U	9506-U	-	-	-
Joslyn (Brewer-Titchener)	9503-S	9504-S	9504-S	9505-S	9506-S	-	-	-
Knox	9503-U	9504-U	9504-U	9505-U	9506-U	-	-	-
Lapp	51453	51456	51456	51459	51465	-	-	-
Ohio Brass	87085	87105	87105	87115	87135	-	-	-
*Preformed	-	AGS	AGS	AGS	AGS	-	-	-

*Clevis type available.

ej
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ej - Clamps, deadend with socket eye

	ACSR				
	AWG	kcmil			
	2/0 to 4/0	266.8	366.4	477	556.5
Iron or Steel Clamps (Require armor tape or liner)					
I-T-E (Victor)	5001	5002	5002	5003	
Joslyn (Brewer-Titchener)	5001	5002	5002	5003	
Knox	5001	5002-B	5002-B	5003	
Lapp	11501	11502	11502	11503	
Locke	45001	45002	45002	45003	
Ohio Brass	80440	80445	80445	80450	
Aluminum Alloy Clamps (Do not require armor tape or liner)					
Anderson	SD-57-S	SD-70-S	SD-86-S	SD-86-S	SD-98-S
Bethea/National	ADE-21-S	ADE-22-S	ADE-23-S	ADE-24-S	
C & R	CR-10-60S	CR-20-60S	CR-20-60S	-	
I-T-E (Victor)	52001	52011	52021	52031	
Joslyn (Brewer-Titchener)	5200	5201	5202	5203	
Knox	5200	5201	5202	5203	
Lapp	51530	51533	51536	51536	
Ohio Brass	86536	86540	86546	86546	

NOTE: When used with clevis-type insulators for large conductors on distribution lines, order clamp with clevis eye.

gx - Single Pole Steel Structure with Arms

Applicable Specification: REA Specification for Single Pole Steel Structures Complete with Arms, T-9

Manufacturer	Meeting No. and Date	Conditions
C-E American Single circuit, delta conductor arrangement - Type 1 Single circuit, vertical conductor arrangement - Type 2 Double circuit conductor arrangement - Type 3 Single circuit, large angle arrangement - Type 4	1091 5/27/76	1. To obtain experience. 2. For use only in scenic and urban areas where right-of-way is limited.
Muskogee Iron Works Single circuit, delta conductor arrangement - Type SCD Single circuit, vertical conductor arrangement - Type SCV Double circuit conductor arrangement - Type DC Single circuit, large angle arrangement - Type SCV	1119 7/28/77	1. To obtain experience. 2. For use only in scenic and urban areas where right-of-way is limited.
Power Enterprises, Inc. Single circuit, delta conductor arrangement - Type 1 Single circuit, vertical conductor arrangement - Type 2 Double circuit conductor arrangement - Type 3 Single circuit, large angle arrangement - Type 4	1127 11/17/77	1. To obtain experience. 2. For use only in scenic and urban areas where right-of-way is limited.

gy - Crossarm Assembly for H-frame Construction (Double Arm)

Applicable Specification: REA Specification T-7, Revision dated November 29, 1962

Applicable Drawing : TH-10 Series
No braces (TH-10)
Two vee braces on outside (TH-10V0)
Two vee braces on inside (TH-10VI)
Four vee braces (TH-10V4)

3-5/8" x 9-3/8" x 32' wood crossarm assembly complete with attaching hardware, fittings, bolts and 3-3/8" x 5-3/8" braces.

	Catalog Nos. or Drawing Nos.			
	TH-10	TH-10V0	TH-10VI	TH-10V4
	Items	Items	Items	Items
(Assemblies)	gy	gy and vo	gy and vi	gy and vv
*American Crossarm & Conduit Company	70208	70228	702281	70248
*Brooks Lumber	6410	6410-1	6410-2	6410-3
*Cascadian	CCC1071	CCC1071-V0	CCC1071-VI	CCC1071-V4
*Hughes Brothers	C-3316-A	C-3316-A	C-3316-A	C-3316-A
*Joslyn	REA 62-9	REA 62-10	REA 62-11	REA 62-12
*Niedermeyer-Martin	N-6710	N-6711	N-6712	N-6713
*United (Ky. AEC)	SW16110-0	SW16110-V0	SW16110-VI	SW16110-V4

*Spacer fitting separation as required.

gz - Crossarm Assembly for Wishbone Construction, "Z" Type (Double Arm)

Applicable Specification: REA Specification T-5
Applicable Drawings : REA Drawings TSZ-2 and TMZ-2

3-5/8" x 5-5/8" wood crossarm assembly complete with brace and attaching hardware, fittings, and bolts.

The following manufacturers have shown compliance with the applicable specifications for this assembly:

Manufacturer	Catalog Nos. or Drawing Nos.
American Crossarm & Conduit Co.	602TSZ
Brooks Lumber	64Z2
Hughes Brothers	C-3162-B and C-3162.10
Joslyn Mfg. and Supply Co.	JMS60-5

sb - Switch, disconnect (single-pole, hook-operated station class)

NEMA standard switches for station or line structure use where single-pole switching is permissible

Manufacturer	Type	Voltage Ratings	System Voltages Line-to-Line
Allis-Chalmers	HA	15 thru 69 kV	12.5 thru 69 kV
Bridges	EH	15 thru 69 kV	12.5 thru 69 kV
	EHL(L)	15 thru 69 kV	12.5 thru 69 kV
	HA	15 thru 69 kV	12.5 thru 69 kV
Hi-Voltage (Joslyn)	HU	15 thru 69 kV	12.5 thru 69 kV
	HI	15 thru 69 kV	12.5 thru 69 kV
H. K. Porter (Delta-Star)	B-2M	15 thru 69 kV	12.5 thru 69 kV
	EV(PL)	15 thru 34.5 kV	12.5 thru 34.5 kV
I-T-E	HPL	15 thru 69 kV	12.5 thru 69 kV
	DS(PL)	15 and 23 kV	12.5, 13.2, 24.9 kV
Johnson	HPT	15 thru 69 kV	12.5 thru 69 kV
Kearney	M-72(PL)	15 thru 69 kV	12.5 thru 69 kV
McGraw-Edison	D2(PL)	15 and 23 kV	12.5, 13.2, 24.9 kV
MEMCO	STV	15 thru 69 kV	12.5 thru 69 kV
	STU	15 thru 69 kV	12.5 thru 69 kV
Morgan	DHS (PL included in 15 kV)	15 thru 69 kV	12.5 thru 69 kV
Royal	BT	15 thru 69 kV	12.5 thru 69 kV
S & C	LBD(PL)	15 thru 34.5 kV	12.5 thru 34.5 kV
	Alduti(L)	15 and 25 kV	12,5 thru 24.9 kV

(L) Means solid material load interrupters are available and accepted.

(LV) Means vacuum interrupters are available and accepted.

(PL) Means hooks for portable load interrupters are available.

sc - Regulators, voltage
7.2/12.5 kV
7.62/13.2 kV

Applicable Specification: REA "Specification for Substation Regulators," S-2

Type	Size	Description
	Allis-Chalmers	
JFR	38.1 - 416.3 kVA	(SL) Single phase - step type
LFR	50 amp.	(L) Single phase - step type
	General Electric	
ML-32	19.1 - 509 kVA	(SL) Single phase - step type
MLT	500 - 1000 kVA	(S) Three phase - step type
VML-32	500 - 833 kVA	(S) Single phase - vacuum step type
VMLT-32	1200 - 2800 kVA	(S) Three phase - vacuum step type
	McGraw-Edison	
RSAA	38.1 - 416.6 kVA	(SL) Single phase - step type
RAB	50 amp.	(L) Single phase - step type (Auto-Booster)
	Westinghouse	
ML-32	19.1 - 416.3 kVA	(SL) Single phase - step type
UTS, UTT	167 - 1000 kVA	(S) Three phase - step type

(L) Indicates line use
(S) Indicates substation use

sc - Regulators, voltage
14.4/24.9 kV

Type	Size	Description
		Allis-Chalmers
JFR	72-576 kVA	(SL) Single phase - step type
		General Electric
ML-32	36-576 kVA	(SL) Single phase - step type
VML-32	500-833 kVA	(S) Single phase - vacuum step type
VMLT-32	1200-4666 kVA	(S) Three phase - vacuum step type
		Westinghouse
ML-32	36-288 kVA	(SL) Single phase - step type
		McGraw-Edison
RSAA	72-576 kVA	(SL) Single phase - step type
RAB	50 amp.	(L) Single phase - step type (Auto-Booster)

(L) Indicates line use.
(S) Indicates substation use.

zz - Poles

Pressure Treatment

	Insured Warranted	Independently Inspected
Cowboy Timber Treating, Inc.	-	Manderson, Wyo.
Colfax Creosoting Co.	-	Pineville, La.
Conroe Creosoting Co.	-	Conroe, Texas
Crown Zellerbach Corp.	-	Gulfport, Miss. Mobile, Ala. Urania, La. Sallisaw, Okla.
Dant & Russell, Inc.	-	North Plains, Ore.
Davis Timber Company, Inc.	-	Hattiesburg, Miss.
Delta Creosoting Company	-	Gautier, Miss.
Dickson Treating Co.	-	Canton, Miss.
Dierks Div., Weyerhaeuser Co.	-	DeQueen, Ark.
El Dorado Pole & Piling Co., Inc.	-	El Dorado, Ark.
Eppinger and Russell	-	Chesapeake, Va.
Escambia Treating Co.	-	Brunswick, Ga. Pensacola, Fla. Camilla, Ga.
Fernwood Industries	-	Fernwood, Miss.
Fordyce Wood Preservers, Inc.	-	Fordyce, Ark.
Garland Creosoting Company	-	Longview, Texas
Hart Creosoting Company	-	Jasper, Texas
Edward Hines Lumber Company	-	Mena, Arkansas
Hoosier Treating Company	Gosport, Ind.	Gosport, Indiana
Huxford Pole & Timber Co., Inc.	Huxford, Ala.	Huxford, Ala.

zz - Poles

Pressure Treatment

	Insured Warranted	Independently Inspected
Idaho Pole Company	Bozeman, Mont.	Bozeman, Mont.
International Paper Co. Wood Preserving Division	-	De Ridder, La. Joplin, Mo. Longview, Wash. Navasota, Texas *Wiggins, Miss.
Jasper Creosoting Co.	-	Jasper, Texas
Joslyn Mfg. & Supply Co.	-	Minneapolis, Minn. Richton, Miss.
Kerr-McGee Chemical Corp. Forest Products Div.	-	Meridian, Miss. Columbus, Miss. Texarkana, Texas
Koppers Co. Inc.	-	Carbondale, Ill. *Denver, Colo. Florence, S. C. Gainesville, Fla. Grenada, Miss. Houston, Texas *Montgomery, Ala. N. Little Rock, Ark. *Oroville, Cal. Salisbury, Md. Richmond, Va. Galesburg, Ill. Nashua, N. H.
Lake States Wood Preserving, Inc.		Munising, Mich.

* Cellon process also accepted.

zz - Poles

Pressure Treatment

	Insured Warranted	Independently Inspected
Texas Tie & Timber Co. (W. J. Smith Wood Preserving Co.)	-	Denison, Texas
Union Timber Corp.	-	Homerville, Ga.
Weekly Lumber Co.	-	Rockledge, Fla.
	-	Tampa, Fla.
Western Tar Products Corp.	-	Terre Haute, Ind.
Western Wood Preserving Co.	-	Sumner, Wash.
Wheeler Div., St. Regis Paper Company	Whitewood, S. D.	Whitewood, S. D.
	Cass Lake, Minn.	Cass Lake, Minn.
Whitewood Post & Pole Co.	Whitewood, S. D.	Whitewood, S. D.
Wood Treating, Inc.	-	Picayune, Miss.
Wyckoff Company	W. Seattle, Wash.	W. Seattle, Wash.
	-	Bainbridge Island, Wash.

zz - Poles

Thermal (Non-Pressure) Treatment

	Insured Warranted	Independently Inspected
J. H. Baxter & Co.	-	Quendall, Wash. Arlington, Wash.
Bell Lumber & Pole Co.	-	Minneapolis, Minn.
Ted Butcher, Inc.	-	Sandpoint, Idaho
B. J. Carney & Co.	-	Spokane, Wash.
Cascade Pole Co.	-	Tacoma, Wash.
Cedar Service, Inc. (R. G. Haley and Co., Inc.)	-	Bemidji, Minn.
Idaho Pole Co.	Bozeman, Mont.	Bozeman, Mont.
Joslyn Mfg. & Supply Co.	-	Minneapolis, Minn.
Kalispell Pole & Timber Co.	-	Kalispell, Mont.
MacGillis and Gibbs Co.	-	Minneapolis, Minn.
L. D. McFarland Co.	Eugene, Ore. Sandpoint, Idaho	Eugene, Ore. Sandpoint, Idaho
Oeser Cedar Co.	-	Bellingham, Wash.
Page & Hill Forest Products	-	Big Falls, Minn.
Poles Incorporated	-	Newport, Wash.

U an - Transformers, distribution, pad-mounted, dead-front

(For underground application)

Applicable Specifications: "REA Specifications for Pad-Mounted Transformers," U-5

Manufacturer	Single Phase	Three Phase
Central Moloney (2,4)	"REA-LP" 25-167 kVA	
ERMCO (3,4)	"Low Profile" 10-75 kVA	
General Electric (2,4)	"Mini-Pad III - REA" 10-167 kVA	"Compad II - REA" 75-2500 kVA
Howard (2,4)	"HiPad REA" 10-167 kVA	"HiPad 3 REA" 45-2500 kVA
Kuhlman (2,4)	"Lo-Pak ALR" 25-167 kVA	
McGraw-Edison (2,4)	Series 20/30 REA 25-167 kVA	"REA Pad-Mount" 75-2500 kVA
NECO (2)	HMM-R, 10-50 kVA SP-R, 75-167 kVA	TP-R, 45-1000 kVA
H. K. Porter (2,4) (Delta-Star)	"Low Profile U 5-R" 25-167 kVA	"Porter U5-R3" 225-2500 kVA
RTE (2,4)	"REA Shrubline" 15-167 kVA	"REA Terra-Tran" 45-2500 kVA
Dowzer (3,4)	"METRI-PAD" 25-167 kVA	
Standard (3,4,5)	-	"Mini-Pad REO10" 75-300 kVA "Stan-Pad REO10" 500-1500 kVA
United (Ky. AEC) (2,4)	"Pad-Mount" 15-75 kVA	

(1) 7.2/12.5 and 7.6/13.2 kV
(2) 7.2/12.5, 7.6/13.2 and 14.4/24.9 kV
(3) 7.2/12.5 and 7.6/13.2 kV (conditional listing for 14.4/24.9 kV)
(4) Dual voltage - same as for 14.4/24.9 kV, single phase
(5) Three-phase listing applies to 7.2/12.5 and 7.6/13.2 kV only

U an - Transformers, distribution, pad-mounted, dead-front

(For underground application)

Applicable Specifications: REA Specifications for Pad-Mounted Transformers - U-5

Manufacturer	Single Phase	Three Phase
VanTran (3,4)	"Mini Pad U5" 5-167 kVA	"VanPad III-U5" 30-2500 kVA
Wagner (2,4)	"Turfline II-R" 25-167 kVA	-
Westinghouse (2,4)	"Mini-Pak U-5" 25-167 kVA	CTP-U5, 75-500 kVA "Plazapad - U5" 750-2500 kVA

(1) 7.2/12.5 and 7.6/13.2 kV.
(2) 7.2/12.5, 7.6/13.2 and 14.4/24.9 kV.
(3) 7.2/12.5 and 7.6/13.2 kV (conditional listing for 14.4/24.9 kV).
(4) Dual voltage - same as for 14.4/24.9 kV, single phase.
(5) Three-phase listing applies to 7.2/12.5 and 7.6/13.2 kV only.

U ax - Cutout and Arrester, Combination for undergound system pole risers

Nominal System Voltage	For 7.2/ 12.5 kV Wye		For 7.6/ 13.2 kV Wye	For 14.4/ 24.9 kV Wye
Cutcut Max. Voltage Rating	7.8 kV	15 kV	15 kV	27 kV
Application	Single Phase Risers	Three Phase Risers	Single & Three Phase Risers	Single & Three Phase Risers
Cutout Current Rating	100 amps	100 amps	100 amps	100 amps
Manufacturer	Catalog Numbers			
Chance	T70J-2B3409	T70J-2F2409	T70J-2F2409	--
General Electric	9F80A&B	9F80A&B	9F80A&B	--
Joslyn	J9237-P2	J9237-P2/R	J9237-P2/R	J9267-D2
Southern States	CA Series	CA Series	CA Series	CA Series

NOTE: The units listed on this page may be used with single arresters or arresters in parallel, but must be applied in accordance with paragraph VI.A., REA Bulletin 61-3, "Underground Rural Distribution." Other arresters listed on pages ae-1 and ae-2 may be used for underground systems when applied in accordance with this bulletin.

Cutouts used on underground riser poles should be loadbreak type or have hooks for portable load interrupters.

U cg - Switch, air, three-pole, group-operated for pole-mounted cable risers (Factory Preassembled)

Manufacturer	Mounting	Side Break Type kV
Chance	Vertical	D4,D5(L)15-27
	Horizontal	D4,D5(L)15-27
S & C	Vertical	Alduti(L)15-25
	Horizontal	Alduti(L)15-25

(L) Means gas or solid material full-load interrupters are accepted and available.

NOTE: Switches with factory-assembled crossarm type bases must have nonconducting crossarm type bases, nonconducting braces, and insulated interphase and control rods.

U gc - Shield, cable riser

Manufacturer	Dia. (Inches)	Length (Feet)
	Galvanized Steel	
Chance	2 - 3 - 3½	5 - 9
*Electrical Materials	2 - 3 - 4 - 5	5
*#Fargo(Utility Products)	2¼ - 3¼ - 3-3/4 5	5 - 8 3 - 5
*Joslyn	2 - 3 - 3½	5 - 8
*McGraw-Edison	2 - 3 - 4	3 - 5 - 10
	Plastic and Fiberglass	
*Carlon (plastic)	2 - 3 - 4 - 5	10
*Electrical Materials(plastic)	2 - 3 - 4 - 5	5 - 10
*Hercules (Haskon) (plastic) (Power Mold I, II, III)	2 - 3 - 4 - 5	5 - 9½ - 10
*Joslyn (plastic)	2 - 3 - 4 - 5	5 - 10
*Nordic (fiberglass)	2½ - 3½ - 5½	5 - 10

(Order by size and length)

#All sizes available with galvanized finish or painted green over galvanizing.

*All sizes available with backing plate.

U gk - Terminations, Indoor

(When ordering specify conductor size, type, whether copper or aluminum and insulation diameter)

Manufacturer	Voltage Class	Catalog No.
Joslyn	15 kV	J9275

U gk - Terminations, Outdoor (with mounting hardware)*

(When ordering specify conductor size, type, whether copper or aluminum, insulation diameter, and type of mounting desired)

Manufacturer	Meeting No. and Date	Conditions
Elastimold (ESNA)		
Style 16-THG (15 and 25 kV)	921(6/26/69)	To obtain experience.
Style 35-MT (35 kV)	945(6/11/70)	
	1098(9/23/76)	
General Electric		
Termi-Matic, Type G	938 (3/5/70)	To obtain experience.
(15, 25 and 35 kV)	914 (3/20/69)	
	1083 (2/5/76)	
Joslyn		
"Easy-On II"	1111	To obtain experience.
(15, 25 & 35 kV)	3/31/77	
3M		
5900 Series	966	To obtain experience.
15 kV (4/0 AWG and larger)	5/6/71	
25 kV (#2 AWG thru 750 MCM)	969	
"Quick-Term" 5800 Series,	6/17/71	
bracket mounted,	1054	
15 kV (#2 thru 3/0 AWG)	11/27/74	
MT Series (15, 25 and 35 kV)	1083	
	2/5/76	
ITT Blackburn		
Type P, 15 & 25 kV	997 (7/27/72)	To obtain experience.
(#4 thru 4/0 AWG)	1037 (3/21/74)	
Type MP, 35 kV	1043 (6/13/74)	

* Mounting hardware is used to attach termination to mounting bracket (U hd or U hj).

Conditional List
U gk(1.2)
July 1977

U gk - Terminations, Outdoor (with mounting hardware)*

(When ordering specify conductor size, type, whether copper or aluminum, insulation diameter, and type of mounting desired)

Manufacturer	Meeting No. and Date	Conditions
Chance C552-0395 Series 15 kV (#2 thru 2/0 AWG)	1058 2/6/75	To obtain experience.
Raychem Thermofit HVT (15, 25 and 35 kV)	1054 11/27/74	To obtain experience.
Kearney 111508 Series (15 kV)	1091 5/27/76	To obtain experience.
Bishop SWO Kit (15, 25 & 35 kV)	1109 3/3/77	To obtain experience.

*Mounting hardware is used to attach termination to mounting bracket (U hd or U hj).

U hb - Cable Accessories

(When ordering specify conductor size, type, whether copper or aluminum and insulation diameter)

Manufacturer	Meeting No. and Date	Conditions
General Electric		
15 kV, used with loadbreak connectors Switch module 9U02AAA001 Basic connector module 9U05 Series	930 10/30/69	To obtain experience.
25 kV, used with loadbreak connectors Switch module - 9U02BAA001 Insulating cap - 9U01BEB001	1016 5/10/73	
Joy		
15 kV, used with loadbreak connectors Protective cap - X8946-231 Fast close bushing plug	1090(5/13/76) 1000(9/14/72)	To obtain experience.
25 kV, used with loadbreak connectors Protective cap - X8975-12	1090(5/13/76)	
Kearney		
25 kV, used with loadbreak connectors No. 112500 Bushing plug*	966 5/6/71	To obtain experience.
RTE		
15 kV, used with loadbreak connectors No. 2603711A12 protective cap	1033(1/17/74)	To obtain experience.
No. 2604797B01 bushing well insert*	1126 11/3/77	
No. 2625194A01 two-way bushing well insert*		
No. 2604231B01 bushing well plug		
25 kV, used with loadbreak connectors No. 2606591A02 protective cap	1033(1/17/74)	
35 kV, used with loadbreak connectors No. 2606630A01 protective cap	1048(8/22/74)	

*NOTE: Asterisk indicates single or three phase. Other bushing plugs for use with loadbreak connectors are single phase only.

Conditional List
U hb(2.1)
July 1977

U hb - Cable Accessories

(When ordering specify conductor size, type, whether copper or aluminum and insulation diameter)

Manufacturer	Meeting No. and Date	Conditions
Reliable		
Concentric neutral bonding clamp (Nos. 2329 & 2330)	1037 3/21/74	1. To obtain experience. 2. Only for bonding of anodes or other metals to the neutrals of existing cable installations. 3. Not to be used to connect neutral to grounding electrodes.
Harco		
URD cable clamp	1114 5/12/77	(Same as above)

U hb - Cable Accessories

(When ordering specify conductor size, type, whether copper or aluminum and insulation diameter)

600 Ampere Continuous Current Rating

Manufacturer	Meeting No. and Date	Conditions
Elastimold (ESNA)		
15 kV, used with non-loadbreak connectors 600, 650 Series 25 kV, used with non-loadbreak connectors K600, K650 Series	1016 5/10/73	To obtain experience.
35 kV, used with non-loadbreak connectors 750LR Series	1064 5/1/75	
RTE		
15 kV, VBT Tee connector No. 2604360B Series 15 kV, Protective cap No. 2625041A01	1126 11/3/77	To obtain experience.

U hc
July 1977

U hc - Cable Supports
15 and 25 kV

Manufacturer	Catalog Number	Grip Dia. Range (inches)
Kellems	022-16-011	0.81 to 0.94
	022-16-012	0.87 to 1.00
	022-16-013	0.94 to 1.06
	022-16-014	1.00 to 1.18
	022-16-015	1.06 to 1.25
	022-01-018	1.25 to 1.50
Lewis	A-U-SW-18	0.75 to 1.25
Economy Cable Grip	SPJ087-U	0.87 to 1.00
	SPJ100-U	1.00 to 1.12
	SPJ113-U	1.12 to 1.25
	SPC125-S-U	1.25 to 1.50
Fargo	GJ-854	0.718 to 0.919
	GJ-855	0.920 to 1.12
	GJ-856	1.12 to 1.50
Aluma-Form	CS-800 Series	0.75 to 2.0
Woodhead	36170 (SC14)	0.81 to 0.95
	36171 (SC15)	0.89 to 1.01
	36172 (SC16)	0.94 to 1.07
	36173 (SC17)	1.00 to 1.19
	36174 (SC18)	1.06 to 1.26
	35034 (SC125U)	1.25 to 1.50

U hq - Terminations, Multipoint

Use with Loadbreak Connectors
(When ordering specify conductor size, type, whether copper or aluminum and insulation diameter)

Manufacturer	Meeting No. and Date	Conditions
Elastimold (ESNA)		
Cable tap	921	To obtain experience.
1601-CT	6/26/69	
Single Cable Tap		
1601-SCT		
15 kV		
2-way bushing, 163J2*	1068 (6/26/75)	
3-way bushing, 163J3*	1068 (6/26/75)	
3-way bushing, 1601-J3	921 (6/26/69)	
4-way bushing, 163J4*	1068 (6/26/75)	
4-way bushing, 1601-J4	945 (6/11/70)	
RTE		
LBC-2, 2-way bushing, 15 kV	924	To obtain experience.
2600730C04 - single phase	8/7/66	
2604883B01 - three phase		
LBC-3, 3-way bushing, 15 kV	1126	
2600730C08 - single phase	11/3/77	
2604883B02 - three phase		
LBC-4, 4-way bushing, 15 kV		
2600730C12 - single phase		
2604883B03 - three phase		
General Electric		
Tee connector module	930	To obtain experience.
9U04 Series	10/30/69	
25 kV	1016	
2-way bushing-9U07BDB210	5/10/73	
3-way bushing-9U07BEB310		
4-way bushing-9U07BEB410		
ITT Blackburn		
J2BA (2, 3, 4-way) 15 kV	1110	To obtain experience.
JJ2BA* (2, 3, 4-way) 15 kV	3/17/77	

*NOTE: Asterisk indicates single or three phase. Other terminations for use with loadbreak connectors are single phase only.

U hq - Terminations, Multipoint

Use With Non-loadbreak Connectors
(When ordering specify conductor size, type, whether copper or aluminum and insulation diameter)

Manufacturer	Meeting No. and Date	Conditions
Elastimold (ESNA)		
Style 150-T, T-Tap (15 kV)	873 7/27/67	To obtain experience.
Style K-150-T, T-Tap (25 kV)	921 6/26/69	
ITT Blackburn		
J2CA (2, 3, 4-way) 25 kV	1110 3/17/77	To obtain experience.
RTE		
VBJ-2, 2-way bushing, 15 kV, 2604670B01	1126 11/3/77	To obtain experience.
VBJ-3, 3-way bushing, 15 kV, 2604670B02		
VBJ-4, 4-way bushing, 15 kV, 2604670B03		

U hr - Secondary tap or splice cover, submersible

Manufacturer	Type or Catalog No.
Bishop	Splice-Wrap
Blackburn	Type DBS
Elastimold (ESNA)	Style 86
Homac	FSS500 FSS4020
Kearney	Aqua-Seal Kit
3M	PST Series 8400

Heat Shrink Tubing (with sealant throughout)

Manufacturer	Type or Catalog No.
AMP	Black heat-shrink tubing
Electrical Spec. Prod.	HSH
Raychem	WCS cable sleeves
Sangamo	Sigmaform heat-shrinkable products

U hx - Cable route marker

Manufacturer	Catalog No.
Surface Mounted	
Chance	C554-0001
Fargo	GM354
Above Grade	
Chance	C554-0183
Dun-Lap	DL-R45 DL-R712
Lyle	UM12-712

Conditional List
U hy(1)
January 1978

U hy - Splice, Underground, Permanent

(When ordering specify conductor size, type, whether copper or aluminum and insulation diameter)

Manufacturer	Meeting No. and Date	Conditions
AMP		
"Ampact Splice" (35 kV)	1126(11/3/77)	To obtain experience.
Burndy		
Type PMS162-K (15 kV)	981(12/16/71)	To obtain experience.
Elastimold (ESNA)		
Style 25-S, straight splice (15 kV)	873 7/27/67	To obtain experience.
Style 25-Y, Y-splice (15 kV)	921 6/26/69	
Style K-25-S, straight splice (25 kV)		
Style K-25-Y, Y-splice (25 kV)		
General Electric		
"Uni-Matic" (15 & 25 kV) (max. cable size 2/0)	977 10/14/71	To obtain experience.
ITT Blackburn		
Type S (15 kV)	1032	To obtain experience.
Type SC (25 kV)	12/20/73	
Joy		
"Easy Splice" (15 kV)	979(11/11/71)	To obtain experience.
3M		
"Quick-Splice"		
5400 Series (15 kV) (#2 AWG thru 750 kcmil)	969(6/17/71) 1024(8/30/73)	To obtain experience.
5420 Series (25 kV)	1032(12/20/73)	
RTE		
15 kV - 2606780A Series straight splice	1122 9/8/77	To obtain experience.
25 kV - 2606825A Series straight splice		
35 kV - 2603934B Series straight splice	1058 2/6/75	
15 kV - 2602429B Series Y-splice	1033 1/17/77	
Somerset		
Straight splices		
Style 15 DHS (15 kV)	1014	To obtain experience.
Style 25 DHS (25 kV)	4/12/73	
Style 35 DHS (35 kV)		

U ja - Transformer Pad (Plastic)

Manufacturer	Meeting No. and Date	Conditions
Carolina Dielectrics Model 0502-1 Fiberglass Size: 40" x 44"	1000 9/14/72	To obtain experience.
Chance C107-0162 and C107-0171 Fiberglass Size: 40" x 44"	994 6/29/72	To obtain experience.
Fiberglass Specialists Molded polyethylene Size: approx. 41" x 41"	989 4/13/72	To obtain experience.
Highline HL-46B, Fiberglass Size: approx. 42" x 42"	989 4/13/72	To obtain experience.
Plastic Structures No. 40402012 Molded polyethylene Size: 40" x 40"	997 7/27/72	To obtain experience.
Thermodynamics Poly-Pad, PR Series* Molded polyethylene	998(8/17/72) & 1009(2/1/73)	To obtain experience.
Sonoco Products No. 6000383 Reinforced plastic Size: 43" x 48"	1068 6/26/75	To obtain experience.

Transformer Pad (Sleeve)

Concast Fibercrete modular bases	1125(10/21/77)	To obtain experience.
Durham UGS Series* Models A, B, C & D Steel box pad	1065 5/15/75	To obtain experience.
Highline Box Pad HL-45A Size: L-43", W-3$\frac{1}{2}$", D-32"	1002 10/12/72	To obtain experience.

*Order by catalog number and size.

Conditional List
U jb
July 1977

U jb - Splice Shield
(Refer to Drawing UM45-4)

Manufacturer	Meeting No. and Date	Conditions
Kellems No. SE 594-2	1035 2/21/74	To obtain experience.

U si - Anodes, sacrificial
(Drawings UM-11, UM11-1, UM-26, UM-27, M2-7)

Zinc

Federated Metals Corporation

Western Lead Products (Bunker Hill)

Magnesium

Dow Chemical Company, USA

Federated Metals Corporation

Garfield Alloys

Halaco Engineering

International Metals

Kaiser Magnesium

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